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16.12.87 Bulletin 87/51(71) Applicant: **EATON CORPORATION**  
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(54) Hydraulic lash adjuster with combined reservoir extension and metering system.

(57) A hydraulic lash adjuster (10) for valve gear of an internal combustion engine, having a plunger member (44) reservoir chamber (50) with a fluid passageway (70) into the chamber that is substantially lower than the actual vertical height of the chamber and with a reservoir extender means (66) for extending the oil reservoir chamber to a height well above the height of the fluid passageway (70) and a means (78, 86) to precisely meter the flow of oil from the plunger member (44) chamber (50) through a bleed orifice (71) passing through the upper end of the adjuster plunger member (44) with the metering means (78, 86) retained and supported by a reservoir extender means (66).

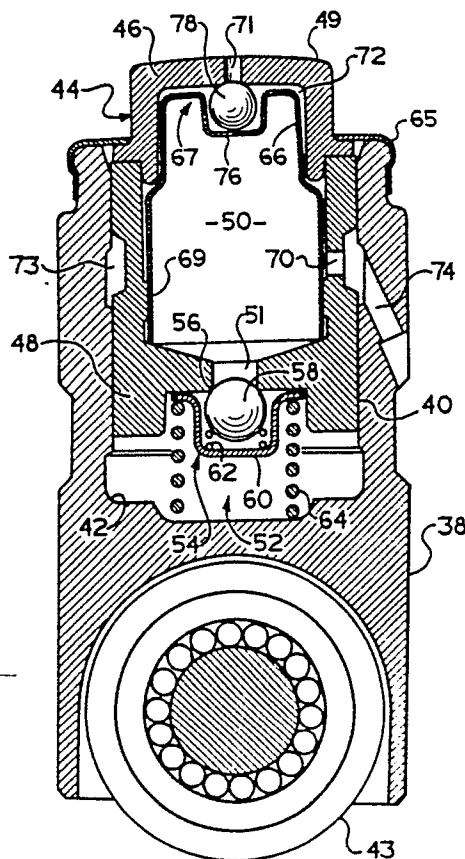


FIG. 2

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| DOCUMENTS CONSIDERED TO BE RELEVANT  |  |  |   |
|--|--|--|---|
| Category   | Citation of document with indication, where appropriate, of relevant passages                      | Relevant to claim                              | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| P,X  | US-A-4 607 599 (BUENTE)<br>* Column 3, lines 3-14; figure 4<br>*                                   | 1-3  | F 01 L 1/24                                   |
| Y  |  | 4-6  |   |
| P,D<br>X   | ---<br>US-A-4 584 976 (HILLEBRAND)<br>* Column 3, lines 44-65; column 5, lines 3-46; figures 3-5 * | 1-3  |   |
| P,D<br>Y   |  | 4-6  |   |
| Y  | ---<br>GB-A-2 132 302 (GENERAL MOTORS)<br>* Page 1, line 119 - page 2, line 89; figures 1-3 *      | 4  | TECHNICAL FIELDS SEARCHED (Int. Cl.4)         |
| A  |  | 1-3  | F 01 L  |
| Y  | ---<br>GB-A- 987 552 (JOHNSON)<br>* Page 2, lines 26-55,75-88; figures 1-8 *                       | 5  |   |
| A  |  | 1-3  |   |
|  | --- -/-  |  |   |
| The present search report has been drawn up for all claims   |  |  |   |
| Place of search<br>THE HAGUE   |  | Date of completion of the search<br>06-10-1987 | Examiner<br>LEFEBVRE L.J.F.                   |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p> |  |  |   |



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|---|---|--|---|
| Category  | Citation of document with indication, where appropriate, of relevant passages   | Relevant to claim                              | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| Y   | PATENT ABSTRACTS OF JAPAN, vol. 8, no. 210 (M-328)[1647], 26th September 1984; & JP-A-59 99 013 (FUJI BARUBU K.K.) 07-06-1984<br>* Whole document * | 5  |   |
| A   | Idem  | 1-3  |   |
| Y   | ---<br>GB-A-1 079 679 (BRICO)<br>* Page 2, lines 10-27; sole figure *   | 6  |   |
| A   | ---<br>DE-A-2 343 269 (MOTOMAK)<br><br>* Page 3, line 19 - page 4, line 33; figure 1 *<br><br>-----   |  |   |
| The present search report has been drawn up for all claims  |   |  | TECHNICAL FIELDS SEARCHED (Int. Cl.4)         |
| Place of search<br>THE HAGUE  |   | Date of completion of the search<br>06-10-1987 | Examiner<br>LEFEBVRE L.J.F.                   |
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